

September 10, 2019

Mr. Julius P. Knapp  
Chief Engineer, Office of Engineering and Technology  
Federal Communications Commission  
445 12th Street SW  
Washington, DC 20554

Re: *Request for Waiver/Public Version, ET Docket No. 19-88 --* **EXPEDITED  
ACTION REQUESTED**

Dear Mr. Knapp:

Rohde & Schwarz USA, Inc. (“Rohde & Schwarz”), pursuant to Sections 1.3 and 1.925 of the Commission’s rules, hereby requests a waiver of Sections 15.205 and 15.209 of the Commission’s rules to permit certification of the QPS 201 Personnel Security Scanner (“QPS 201 PSS”) for periodic operation under Section 15.209 of the Commission’s rules.<sup>1</sup> A waiver is necessary because the QPS 201 PSS will operate in the 70-80 GHz band, and Section 15.205 of the Commission’s rules limits unlicensed operations such as these to below 38.6 GHz. A waiver of Section 15.209 would be necessary to accommodate a slightly higher field strength than the limit of 500 microvolts/meter specified in the rule for operations above 470 MHz.<sup>2</sup> As described more fully below, a waiver is warranted in this situation, because there is no risk of harmful

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<sup>1</sup> When Rohde & Schwarz originally filed its waiver request in this proceeding, it sought a waiver of Section 15.231 of the Commission’s Rules, consistent with the relief it was granted in Canada. *Public Notice*, “Office of Engineering and Technology Seeks Comment on Rohde & Schwarz USA, Inc. Request for Waiver of Part 15 Periodic Operation and Restricted Bands Rules for a 70-80 GHz Personnel Security Scanner System,” 34 FCC Rcd 1978 (March 28, 2019). As a result of discussions with Commission staff, Rohde & Schwarz is withdrawing that original request and amending it by substituting this request for waiver.

<sup>2</sup> Consistent with the waiver granted by the Canadian regulators, Rohde & Schwarz requests that the limit for the QPS 201 PSS be set at 31,405 uV/m at 3meters. As demonstrated in the Attachment, even at this higher power limit, there would not be a risk of harmful interference to any other authorized users in this band.

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interference from operating in this band consistent with this request, and the QPS 201 PSS will serve a valuable national security function that cannot be comparably replicated by currently available equipment.

The QPS 201 PSS is a system that allows detection of hidden metallic or non-metallic objects that passengers may carry in or underneath their clothes. The system evaluates reflected (backscattered) microwave signals using an automatic detection software algorithm. The QPS 201 PSS consists of two panels each with two microwave antenna arrays. The panels are arranged to face one another. Metallic or non-metallic objects can be detected by feeding the panels with a signal in the frequency range 70–80 GHz and evaluating the backscatter of the emitted signals. Each panel comprises two antenna arrays, and each array contains 16 antenna clusters. Each antenna cluster is made up of 2 rows of 47 receive antennas and 2 columns of 47 transmit antennas. Thus, each panel contains:

$2 \text{ arrays} \times 16 \text{ clusters} \times 2 \text{ rows} \times 47 \text{ antennas}$  for a total of 3008 antennas.

These antennas are scanned at 128 discrete frequencies, spaced equally within the 70–80 GHz band. A scan is performed by transmitting with each transmitter antenna for 80 ns at a distinct frequency. Then the first antenna is switched off and the next antenna is switched on, with only one antenna operating at a time (all RX antennas receive in parallel). After having transmitted on all antennas on one panel, the procedure is repeated for the second panel.

The transmit antennas have been designed to approach a Lambertian radiator. For a Lambertian radiator, the power density is proportional to the cosine of the angle with the normal of the antenna. In the direction normal to the antenna, the gain is 6 dBi. The transmit antennas transmit essentially only in front of the panel, and virtually nothing behind the panel. The microwaves are of very low intensity – the peak output power is 1 dBm, producing a peak power density at 1 meter range in front of the panel of 80 nW/cm<sup>2</sup> and an average power density of 800 pW/cm<sup>2</sup> – which is several orders of magnitude below the signal level of mobile phones. The typical installation will be with a separation distance of approximately 1.5 meters between the two panels. Attachment A of this Waiver Request provides a more detailed description of the system, along with a demonstration of the lack of a risk of harmful interference to other operations in this band. Attachment A is the public version of the technical information. Rohde & Schwarz has separately filed a non-public version, along with a request for confidential treatment.

Pursuant to section 1.925 of the Commission's rules, waiver may be granted if the petitioner establishes that: (1) the underlying purpose of the rule(s) would not be served or would be frustrated by application to the instant case, and the grant of the waiver would be in the public interest; or (2) in light of unique or unusual factual circumstances, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has

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no reasonable alternative.<sup>3</sup> In addition, the Commission may waive any provision of its rules if good cause is shown.<sup>4</sup> The Courts have held that the Commission may exercise its discretion to waive a rule where particular facts would make strict compliance inconsistent with the public interest.<sup>5</sup> These standards for grant of a waiver are met in this case.

The underlying purpose of the equipment certification requirements and the frequency restrictions for unlicensed operations is to prevent harmful interference.<sup>6</sup> That purpose is fully satisfied by the QPS 201 PSS operations in the 70-80 GHz band because of its very low power, directed radiation, the propagation characteristics of this band and the exceedingly short transmissions.<sup>7</sup> Indeed, the QPS scanners have been operating in this band in Europe and Canada without any incidents of interference to the vehicular radars that also operate in this band. Similarly, the U.S. Transportation Security Administration (“TSA”) has been operating

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<sup>3</sup> 47 C.F.R. § 1.925. *E.g., Bird Technologies’ Request for Waiver of Section 90.219 Regarding Signal Booster Designation*, DA 15- 353, March 19, 2015.

<sup>4</sup> 47 C.F.R. § 1.3. *E.g., Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of the FCC’s Rules to Improve Wireless Coverage Through The Use of Signal Boosters*, 29 FCC Rcd 1260 (2014).

<sup>5</sup> *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C.Cir. 1969).

<sup>6</sup> The equipment certification requirements also ensure compliance with the human RF exposure limits, but Rohde & Schwarz is not seeking a waiver of those requirements. The QPS 201 complies with the Commission’s radiation limits, as will be demonstrated in its certification submission.

<sup>7</sup> In its comments on Rohde & Schwarz’s original waiver request, CORF raised concerns regarding potential interference by the QPS 201 PSS to protected radio astronomy observations at 76-81 GHz. CORF also suggested conditions that would apply to the waiver to protect against any such interference. Rohde & Schwarz believes that the low power of the QPS 201 PSS transmitters, the directionality of those transmissions and terrain shielding of the radio telescopes should limit the risk of harmful interference. Indeed, the Commission determined that these factors were sufficient to mitigate the risk of harmful interference to radio astronomy observations when it authorized automotive radars to operate in the 76-81 GHz band. *Amendment of Parts 1, 2, 15, 90 and 95 of the Commission’s Rules to Permit Radar Services in the 76-81 GHz Band*, 32 FCC Rcd 8822 (2017) at ¶¶ 19-24. Nevertheless, Rohde & Schwarz acknowledges the hyper-sensitivity of the potentially affected radio telescopes, as well as the importance of the research those radio telescopes are used to conduct. Thus, out of an abundance of caution and in order to expedite grant of this waiver, Rohde & Schwarz does not object to the Commission’s initially imposing a condition as suggested by CORF that would prohibit outdoor use of the QPS 201 PSS within 70 kilometers of the U.S. observatories indicated in the CORF comments.

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one of the QPS scanners under an evaluation program at an airport in the United States without any interference issues. Thus, grant of the requested waiver would not frustrate the purpose of Section 15.205 of the Commission's rules.

Rohde & Schwarz acknowledges that its non-conforming use in the 70-80 GHz band would be on a secondary basis. Rohde & Schwarz recognizes that it cannot cause any interference, and must tolerate interference from authorized operations. Rohde & Schwarz will maintain a 24-hour point of contact in the exceedingly unlikely event that the QPS 201 PSS is believed to cause any interference, so that we can assist with any investigation, and any problematic installations can be shut down promptly.

Grant of the waiver would, moreover, well serve the public interest. Use of the QPS 201 PSS would enhance national security in the United States, because it has many advantages over other currently available scanners for deployment at airports, arenas, courthouses, federal buildings and other venues where screening is critical. These advantages include:

- Easier for persons being scanned as they do not have to raise their hands above their head
  - Raising of the arms may be difficult for elder people.
  - Tall passengers have difficulties to place the hands above the head in competitor's cabin as cabins may not be high enough
- The QPS 201 does not use a "cabin" – the panels stand on their own
  - Some Passengers do not like to enter cabins (claustrophobia) or at least feel uncomfortable within a cabin
  - Easy bypass for wheelchair users
- Scanning time of only 164 ms (32ms transmission by one panel, 100ms pause, 32ms transmission by other panel) minimizes false alarms caused by movements of the passenger/guest. Competitor's scanning times in excess of 1 second bears higher risk for movement of passenger/guest during scan, resulting in false alarms
- No obstacle in case of panic or a need to evacuate quickly (*e.g.*, fire)
- More privacy for the persons being scanned
  - The QPS scanner does not provide a picture of the body but rather displays an avatar with the potential location of forbidden substances
- Excellent oversight on entire security lane and process
  - Operator can observe the next person in line
  - Operator has physical access to passenger being scanned

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- High redundancy: Failure of few antennas does not significantly reduce detection quality
  - Only one TX-Antenna is transmitting at a time. All RX-Antennas are receiving simultaneously
- No moving parts – improves the reliability and availability of the scanner

The capability of the QPS scanners in enhancing screening functionality has been recognized by the many national security entities that have evaluated its capabilities. TSA has approved the similar (and from an RF perspective identical) Rohde & Schwarz QPS 200 PSS for use at airports,<sup>8</sup> and is currently evaluating the QPS 201 PSS. In Europe, the European Civil Aviation Conference (ECAC) has certified the QPS scanners for Standard 1 and Standard 2.<sup>9</sup> Canada's ISED has certified the QPS scanner under a Special Authorization (waiver), because Canada also generally limits unlicensed devices to operations below 38.6 GHz.<sup>10</sup> The QPS scanner has also been certified for German Federal Police requirements. These other certifications confirm the public interest benefits that would result from grant of the requested waiver.<sup>11</sup>

In sum, the standards for grant of a waiver have been met in this case. There is no risk of harmful interference, and there is good cause, because the public interest would be well served by the resulting enhancements to national security from the availability of the QPS 201 PSS. Rohde & Schwarz thus respectfully requests expeditious grant of the waiver that would permit it to obtain certification of the QPS 201 Personnel Security Scanner.

Sincerely,

/s/

Stephen L. Goodman  
Counsel for Rohde & Schwarz USA, Inc.

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<sup>8</sup> [https://www.rohde-schwarz.com/us/about/news-press/details/press-room/press-releases-detailpages/rohde-schwarz-achieves-transportation-security-administration-tsa-certification-for-its-r-s-qps200-security-scanner-press\\_releases\\_detailpage\\_229356-503426.html](https://www.rohde-schwarz.com/us/about/news-press/details/press-room/press-releases-detailpages/rohde-schwarz-achieves-transportation-security-administration-tsa-certification-for-its-r-s-qps200-security-scanner-press_releases_detailpage_229356-503426.html).

<sup>9</sup> A link to the ECAC certified security scanners is available here: <https://www.ecac-ceac.org/cep>.

<sup>10</sup> Copies of the Canadian Special Authorization and certification are included in Attachment A.

<sup>11</sup> *Cf.*, 32 *Technologies LLC Request for Waiver of Part 15 of the Commission's Rules Applicable to Wideband Systems*, DA 18-1210, released November 30, 2018 (waiver justified because no greater risk of causing harmful interference and grant of the waiver will serve the public interest).

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